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**American Airpower:  
The Emergence of a Dominant Tactical Advantage**

**A Monograph  
by**

**Major Robert R. Soucy, II  
Air Force**



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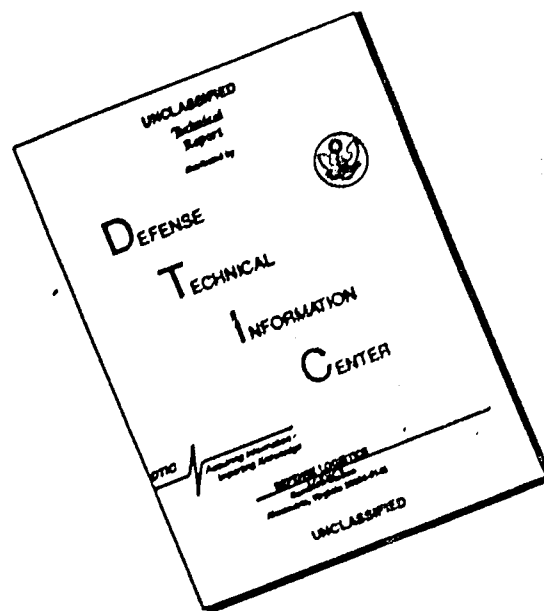
**School of Advanced Military Studies  
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## ABSTRACT

**AMERICAN AIRPOWER:** The emergence of a dominant tactical advantage by MAJ Robert R. Soucy II, USAF, 50 pages.

This monograph discusses the importance of understanding US airpower (Air Force, Navy, Marines and Army) in order to better appreciate its tactical contribution to joint warfighting. Even after the Persian Gulf war misunderstandings persist and seem to come about because of fixations on roles and performances in earlier eras. Historical examples and quantitative data are used to present a more realistic picture of present US airpower capabilities.

The monograph uses four historical examples to provide a broad perspective on how US airpower matured. Tactical airpower impacts are traced starting with the battle for Buna in the Southwest Pacific during World War II. The analysis continues with the defense of the Pusan perimeter in the Korean war, the US response to the 1972 invasion of the South by North Vietnam, and the Persian Gulf war. Quantifiable airpower characteristics for each period complement the qualitative historical evidence. The analysis closes with the highlighting of enduring strengths and recurring weaknesses.

The monograph concludes that American airpower has changed considerably since the early days of WW II. What exists today is a remarkable constellation of still evolving capabilities that are all at once integrated, interdependent and complementary. While not perfect, history has clearly shown that US airpower has emerged as a devastatingly effective tactical weapon in battle. The key remaining question is whether or not US military leaders truly appreciate how airpower has changed.

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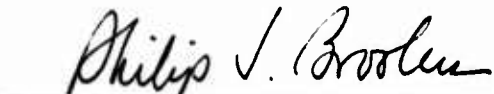
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## INTRODUCTION

In peace time, differences of opinion may be allowed to go by the board without great harm being done...In war the case is different - chickens remorselessly and rapidly come home to roost, errors can seldom be rectified (the enemy will see to that) and men's lives are at stake.

Field Marshall Sir William Robertson 1

Differences of opinion about the effectiveness of airpower in the Gulf War (Operations Desert Shield and Desert Storm) became apparent soon after the war in newspaper articles and editorial columns. <sup>2</sup> Two contrasting schools of thought emerged during the debate. Military analyst Harry Summers (U.S. Army Colonel, retired) took the position that airpower ably fulfilled its traditional support role. He wrote:

My suspicion is that the Army Command and General Staff School was right in 1936 when it concluded that while it might not be decisive, "air power...will constitute one of the important supporting units in the conduct of a war." <sup>3</sup>

Others disagreed with Summers. Alan Gropman, a retired US Air Force Colonel and a professor at the National War College, fired off a scathing response that took Summers to task for not being open-minded enough to appreciate the meaning of what happened in the Gulf. He said,

...air power cleansed the skies in the first days, destroyed the enemy's command and control of its forces, interdicted all lines of communication and destroyed Iraqi armor and other ground forces; in a word, air power eviscerated Iraq's military... <sup>4</sup>

These two positions may seem similar but closer examination reveals they are quite different. The first suggests that airpower is just a good supporting arm; the second maintains that airpower can now be the main tactical effort, carrying the fight itself directly to the enemy. Which position is right? Are both positions wrong? Or, as philosopher Carlo Carretto suggests, will the truth be found in a difficult to reach synthesis of opposites?<sup>5</sup> This paper attempts to resolve these important differences in opinion about airpower because, as Joint Pub 1 states, for the US armed forces "Joint Warfare is Team Warfare"<sup>6</sup> and building a winning joint team<sup>7</sup> will help ensure victory. Understanding what the air part of the US military team can do, whether as the main effort or as a supporting arm, will enable commanders to maximize precious resources and build a strong team.

One key to molding this vital joint success is cohesiveness. This cohesion is an important building block that produces trust and confidence within the team. This bonding takes work; as pointed out in Joint Pub 1,

Trust does not result from good feeling or devout wishes but is based on the mutual confidence resulting from honest efforts to learn about and understand the capabilities each member brings to the team. <sup>8</sup>

In an attempt to help improve joint understanding, this paper will answer the following research question: Has

US airpower emerged as one of America's dominant tactical advantages? The answer is clearly yes. The purpose of this monograph is to show, using a "historical,<sup>9</sup> analytically neutral approach", that focused US airpower has definitely emerged as a very important tactical advantage for America.

### Framework for Analysis

In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened.

10

Billy Mitchell

Mitchell was both right and wrong. Mitchell was right in the context of the early years of airpower because there was not much to look back on. When he began his flight training in 1916 for example, heavier-<sup>11</sup>than-air powered flight was only thirteen years old. Now however, part of Mitchell's perspective is no longer applicable because airpower (as of this writing) has been around ninety years. Although it is still a relatively new dimension of warfare, airpower has been used in all of America's recent conflicts and certain strengths and weaknesses became apparent in each conflict. These trends are noted in an attempt to expand on Mitchell's observation and discover both what has happened and what is perhaps going to happen regarding US airpower.

This trend analysis is accomplished by comparing and contrasting US airpower's impact on four battles in four wars: the battle for Buna on New Guinea in World War II, the battle in defense of the Pusan perimeter in Korea, the 1972 Easter invasion by North Vietnam into the South, and Desert Storm in the Persian Gulf war. Each were conventional, often mechanized, battles. Low intensity conflict and nuclear war are separate topics and, although US airpower has important roles in both, those considerations are beyond the scope of this study.

These battles were also chosen because they were major battles where the normal full complement of combined arms was absent (with the exception of the Gulf war). Generally, the total combat power was limited and airpower was relied upon more either because forces had not yet arrived or had already redeployed out of the areas. The goal was to gain a clearer picture of airpower's impact before it became masked by the natural synergistic effects of combined arms. On the negative side, this isolation could be misconstrued as implying airpower can win battles alone; this was not the intent. The main goal was simply to help differentiate airpower effects from other influences.

This analysis takes two approaches, one quantitative and the other qualitative, to help identify airpower impacts. The state of airpower technology at the time of each battle is noted to provide a baseline comparison

to help measure by how much and in what ways US airpower has quantitatively changed. Certain characteristics are measured. United States Air Force (USAF) doctrine states that elevation above the earth's surface may provide airpower relative advantages over surface forces which can be translated into certain attributes such as speed, range, flexibility, and versatility.<sup>12</sup> This paper highlights these attributes for each period but for simplicity's sake quantifies flexibility and versatility as mission/payload.

Each attribute has a specific definition. Speed is self-explanatory and, according to Sun Tzu, is the essence of war.<sup>13</sup> Speed, whether on the surface or in the air, is very important. J.F.C. Fuller agreed about the virtue of speed; he said: "He who can move twice as fast as his opponent doubles his operative time and thereby halves that of his opponent."<sup>14</sup> Next, range refers to the distance a plane can fly from its base to a target and return home without refueling. General Carl "Tooey" Spaatz, commander of the US Army Air Force strategic bombing force in Europe during World War II said, "Air strategy begins with airplane ranges. Airplane ranges determine the location of bases...(and) fixes the weight and rhythm of the attack."<sup>15</sup> In flight refueling became more common after the Korean war and has altered this perspective but, because not all aircraft have this capability, an unrefueled range is

used for consistency in comparisons. Lastly, mission/payload considers either what the system can do (its specialized mission) or how much it can carry (bombs, cargo, etc.). All these technical aspects are used only as indicators of change. Just as the speed of a tank or a ship only measures a capability and is meaningless until a leader and crew gives direction to the speed, so too are these airpower characteristics only measures of potential at a given time.

The historical perspective provides a qualitative counterbalance to the pure numbers. This paper looks at the impact of US airpower in the broad sense. It is not just about the US Air Force but also about US Navy, US Marine Corps, and US Army personnel manning and using their own aircraft and helicopters, cruise missiles, cargo airlift, aerial refueling systems, reconnaissance platforms, remotely piloted vehicles, electronic warfare systems, and satellites. General "Hap" Arnold, commander of the US Army Air Forces in World War II said "Air power is a composite of airplanes, aircrews, maintenance crews, air bases, air supply, and sufficient replacements...".<sup>16</sup> Air Force Manual 1-1, The Air Force's basic doctrinal manual, also sends a clear reminder to its readers that people are the deciding factor in war and cautions, "[a]lthough airmen tend to emphasize the importance of their equipment, how that equipment is used (the human factor) is far more

important." <sup>17</sup> Thus, taking the larger perspective reveals US airpower as a system where people manipulate complex machines to exploit the aerial dimension of war in order to provide US forces with the best possible advantage during battle.

This paper searches for tactical results therefore the term "tactical" needs defining. Joint Pub 0-1, Basic National Defense Doctrine, says the "tactical level of war is that level at which battle and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces..." <sup>18</sup> USAF Colonel John Warden in his book The Air Campaign calls the tactical level the area "...where opposing forces physically meet, where objectives are unambiguous..." <sup>19</sup> This differs from the operational level of war where "campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives..." <sup>20</sup> These levels are interrelated and can overlap and even merge depending on the situation. <sup>21</sup> The historical examples will show how this occasionally happens.

Finally, this paper assumes the reader understands the need for air superiority as a precursor to success at the tactical level in any conventional conflict. As Colonel Warden wrote in 1988,

Air superiority is a necessity. Since the German attack on Poland in 1939, no country has won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defense has

sustained itself against an enemy who had air superiority. 22

Thus, even though air superiority is a tremendously important factor, in this paper it will be mentioned only to help establish situational context. With these clarifications in mind, it is now time to turn to the analysis of the battle for Buna.

### ANALYSIS

The war in the Pacific saw the tremendous initial successes of the Japanese quickly countered by the US. Within five months of Pearl Harbor the US Navy was fighting the battles of Coral Sea and Midway and the US Marine Corps was preparing for landings at Guadalcanal. The first major US Army / US Army Air Forces offensive battle against the Japanese was at Buna.

The Japanese wanted to use New Guinea as a staging base to interdict the lines of communication between the US and Australia. The Australians, based out of Port Moresby on the southern coast of New Guinea, fought the Japanese as they advanced over the Owen Stanley mountains through the Kokoda pass from Buna on the north coast. On 13 Sep 1942 General MacArthur tasked the American 32nd Division to move from Australia to New Guinea to reinforce the Australians. US airpower would play a key role in this undertaking from the very beginning.



Major General George Kenney, General MacArthur's commander of all allied air forces, had three main aircraft at his disposal: the B-17 for bombing, reconnaissance, and occasional cargo hauling; the P-38 fighter aircraft; and the C-47 cargo plane. The following chart shows their performance characteristics.

23

Buna - US Airpower

	<u>Speed</u>	<u>Range</u>	<u>Msn/Payload</u>
<u>B-17</u>	318 mph	2,000 miles	6,000 lbs bombs
<u>P-38</u>	420 mph	450 miles	4 x 50 cal 2,000 lbs bombs
<u>C-47</u>	220 mph	1,500 miles	6,000 lbs cargo

Kenney put his airlift system to work right away. He volunteered to move troops by air to Port Moresby and, despite resistance and misgivings on the part of MacArthur's staff, moved the 128th Regiment without loss while the rest of the division traveled by

24

sea. For six days, six hundred men landed every twenty-four hours at Port Moresby, fresh and ready to bolster the Australians in the fight with the

25

Japanese. This feat was the greatest airlift ever up

26

to that time. Even B-17's were drafted to haul supplies. In one instance ground commanders asked for some 105-mm howitzers to knock out enemy bunkers. A way was devised for a single B-17 to carry the 105-mm howitzer, along with a tractor to pull it, the guncrew of eight men, fifty rounds of ammunition, a tool kit and

the camouflage net to shield it to a airfield nearby the bunkers; the effort was so successful that B-17's kept making air shuttles until they had carried the entire<sup>27</sup> battery of guns from the rear areas up to the front. These efforts had direct positive tactical effects. Fresh troops arrived quickly at the battlefield and the means to deliver firepower were brought to the critical point.

US airpower also took on the task of interdicting the flow of Japanese supplies. General Kenney noted the Japanese fought under a big handicap:

We could supply by air, while the Nip had to run an air blockade with his vessels every time he wanted another bag of rice, another round of ammunition, or another Jap soldier to replace his losses. 28

Eventually these deep attacks, while never completely severing the Japanese flow of troops and supplies, nevertheless slowed the resupply effort enough that it impacted their tactical operations. For example, one Japanese prisoner commented, "[o]ur troops do not come. Even though they do come they are driven away by enemy<sup>29</sup> planes...". From a technical perspective, airpower was able to help isolate the battlefield because of radar equipped reconnaissance planes which could find and<sup>30</sup> direct attacks against enemy shipping.

Lieutenant General Eichelberger, who assumed command of American and Allied troops in the Buna area on 29 Nov<sup>31</sup> 1942, felt airpower made a good contribution to allied

success. His after action report for the battle noted that American airpower had good effects against the Japanese especially when used to continuously bomb and strafe Japanese positions.<sup>32</sup> Prisoner comments such as "Enemy planes unbearable today",<sup>33</sup> also attest to this positive tactical impact of US airpower. However, despite these successes, several problems arose which limited airpower effectiveness. Fratricide was one problem. The other was ineffective flights because the aircraft were not capable of accurate operations at night or when bad weather reduced visibility.

Although fratricide was not widespread there were several unfortunate incidents with bad effects on ground troop morale. The aircraft had rudimentary navigation and communication equipment and had a difficult time both finding and communicating with the ground forces during close air support missions. One example mentioned by General Eichelberger was when American bombers strafed American troops thinking they were firing on Japanese soldiers three miles away. The American troops, fed up with being shot at by both the Japanese and the US aircraft, fired back at the US planes.<sup>34</sup> Incidents like this detracted from the good US airpower accomplished.

Reduced visibility also reduced airpower effectiveness. Early in the campaign MacArthur's staff felt relying on air support to deliver supplies in bad weather was

unsound and, at one point, advocated withdrawal from  
35  
Buna. In response, Kenney devised methods to air drop  
supplies in zero ceiling foggy conditions; pilots were soon  
air dropping 300 pound supply bundles from 2,500 feet  
36  
altitude into a one hundred yard diameter circle.  
MacArthur sided with Kenney and the next day a week's  
37  
supply of food was delivered by air to the troops.  
However, such a system could not sustain all the  
logistical requirements of the ground forces.  
Eichelberger noted that only once in two months were  
deliveries made in the quantities agreed upon;  
fortunately just enough critical supplies were delivered  
38  
to meet minimum essential needs.

In summary, although US airpower made some important  
tactical contributions it also suffered from some  
troublesome shortfalls. The majority of the burden for  
winning the grueling battle of Buna fell on the 32nd  
division and the other allied ground forces while airpower  
played a noteworthy but minor supporting role. It would  
have a much larger role in helping win one of the first  
battles in the next conflict the US faced - the Korean  
War.

#### THE PUSAN PERIMETER

The Korean War started as the US was still  
transitioning to peacetime from its massive military  
efforts in World War II. The US found itself a

superpower facing an aggressive worldwide Communist threat while simultaneously trying to revamp its economy to meet peacetime demands and demobilize the military. The North Koreans seemingly felt they could exploit this situation and on 25 June 1950 invaded South Korea in an attempt to reunify Korea under their control.

The North Korean People's Army (NKPA) had initial success and drove the Republic of South Korea (ROK) forces and their US advisors down the Korean peninsula. On 6 July Lieutenant General Walker became commander of all allied ground forces in Korea and began to marshal his meager forces to establish a stable defensive perimeter around the key port of Pusan. The US airpower available to help were, for the most part, the standard types of planes, namely fighters, bombers, and cargo planes.

US airpower had changed little since the end of World War II. There were hints of new airpower capabilities such as helicopters and in-flight refueling.<sup>39</sup> However, the three predominate aircraft types during the battle remained the B-29 bomber / reconnaissance ship, the F-80 jet fighter-bomber, and the C-54 airlifter. Each aircraft was capable of the following:

40

Pusan Perimeter - US Airpower

	<u>Speed</u>	<u>Range</u>	<u>Msn/Payload</u>
<u>B-29</u>	360 mph	4,200 miles	18,000 lbs bombs
<u>F-80</u>	605 mph	1,200 miles	6 x 50 cal 4,000 lbs bombs

C-54      285 mph      3,000+ miles      24,000 lbs cargo

Each of these aircraft were improvements on their World War II predecessors with the greatest changes coming in range and payload and jet fighter speed. These changes allowed US airpower to fly and fight from Japan and Okinawa during the early difficult days of the war.<sup>41</sup>

General Walker's air counterpart, Major General Partridge, quickly devised a plan to focus airpower at the most critical points. Two important tasks were undertaken simultaneously; the fight for air superiority and the airlift of troops to Korea. Air superiority was quickly established.<sup>42</sup> At the same time, the other high priority task was the rapid airlift of two battalions and the headquarters element of the US Army's 24th Division from Japan to Pusan and Pohang.<sup>43</sup> The effort to get US troops to the front was slowed by poor weather and the breakup of runway surfaces due to the weights of the heavy air transports; lighter transports were substituted and adjustments made to the airflow to complete the move on 4 July.<sup>44</sup>

By August the NKPA had thirteen rifle divisions, a mechanized division, a tank division, and a tank brigade exerting pressure on Walker's Eighth Army comprised of four US Army divisions, one US Marine Corps brigade, and five ROK divisions.<sup>45</sup> The situation was desperate; allied division frontages were sometimes more than twenty miles long and the entire Eighth

Army reserve was often no more than a company of  
<sup>46</sup>  
troops.

On 31 Aug 1950 the North Korean troops attacked all  
along the Pusan perimeter with the main effort focusing  
on the US 25th Division along the Nam river. <sup>47</sup> Airpower  
was the one remaining allied tactical advantage.  
General MacArthur, the overall theater commander,  
ordered all available Air Force, Marine, and Navy  
aircraft placed under the control of Far East Air Force  
and its subordinate headquarters, Fifth Air Force. <sup>48</sup> The  
primary task was to help General Walker hold.

The massed airpower devastated the attacking NKPA.  
The first ground verifications of the effectiveness of  
the air strikes showed 600 enemy soldiers killed near  
Kigye and another 700 bodies counted by ROK soldiers  
near Pohang. <sup>49</sup> Major General Kean, commander of the 25th  
Division related a story where fighter aircraft strafed  
enemy troops surrounding one of his companies and then  
protected the air transports as they dropped emergency  
resupplies. He said: "The close air support strikes  
rendered...saved this division, as they have many times  
before." <sup>50</sup> The same story repeated itself all around  
the perimeter. A survey of 825 prisoner interrogation  
reports revealed "tactical airpower contributed  
materially to the demoralization of North Korean  
military personnel..the effect produced by tactical  
airpower was ranked second only to a discontent over the

insufficiency of food." <sup>51</sup> The same sentiment was expressed by a North Korean medical officer who reported that in the first month of the war morale was high but that during the second month morale dropped due to "the intensity of enemy aerial activity and superior fire <sup>52</sup> power."

What was the general consensus about US airpower's role in the battle for the Pusan perimeter? Author T. R. Fehrenbach said Korea was mostly an infantryman's war decided down in the "mud, the rugged valleys and cruel mountains" but he also acknowledged that without control of the air and the sea the UN forces would have <sup>53</sup> been forced to leave Korea early in the war. General Walker, the commander of the ground forces defending Pusan, said,

I will gladly lay my cards right on the table and state that if it had not been for the air support that we received from the Fifth Air Force we would not have been able to stay in Korea. <sup>54</sup>

It seems clear that US airpower played the major role in this battle.

But not everything went well. Certain limitations detracted from the otherwise tremendous accomplishments. Fratricide was again a problem. Inadequate facilities and reduced visibility operations also caused a reduction in sorties. Combined together these hinderances caused some concern early on.

Fratricide was a problem during the early days of the conflict because of the fluid situation and unstable



front lines. Poor air-to-ground communications and joint staffs inexperienced with air support coordination<sup>55</sup> procedures also contributed to the early problems.

As noted earlier, a lack of good runways and air facilities to off-load troops and cargo also plagued the air efforts. The NKPA overran some airfields which<sup>56</sup> helped to restrict initial fighter operations forcing the fighters to minimize weapons loads or loiter time<sup>57</sup> because of concerns about fuel. Although the allies eventually built enough airfields to rectify the problem, the initial shortfall was worrisome.

Limited night and poor weather capabilities also curtailed airpower effectiveness. For example, General Vandenberg, Chief of Staff of the Air Force, observed that the poor night interdiction results revealed "our<sup>58</sup> greatest weaknesses."

The NKPA was able to take advantage of these limitations and muster enough strength to carry out the<sup>59</sup> assault on the Pusan perimeter. Despite these shortcomings, US airpower dealt the NKPA a tremendous blow and was the key factor in the defense of the perimeter. The lessons learned in this battle by US airmen would be applied when America found itself involved in a place called Vietnam.

#### VIETNAM 1972

The US sided with South Vietnam to oppose what it perceived as an attempt by North Vietnam to impose a

communist government upon the South. Wary of involvement in ground combat so soon after Korea, the US initially provided limited assistance in the form of military training. The indirect assistance was ineffective, however, and US ground combat forces entered the country in 1965. US public support for the war began to wane after 1968 and the US began to shift the main effort of the war back into the hands of the South Vietnamese forces. By 1972 US troop levels had fallen from a high of 500,000 men down to 95,000 and the stage was set for the North to try to end the war with one final push.<sup>60</sup>

On 30 March 1972 North Vietnam launched a massive offensive using an unprecedented amount of conventional military equipment most of which had seldom been seen in the South.<sup>61</sup> Approximately 600 tanks, surface-to-air missiles (SAMs) such as the SA-2 and SA-7, AT-3 anti-tank missiles, and 130-mm artillery guns were used by the estimated 120,000 North Vietnamese regulars and thousands of Vietcong guerrillas who attacked different parts of South Vietnam in three waves.<sup>62</sup> The South fought in accordance with its US training but soon found itself falling back under the intense conventional onslaught. The US, anxious not to reverse the homeward flow of American ground combat troops, opted to rely on massed US airpower to counter the invasion.<sup>63</sup>

The US airpower that fought in this battle bore little resemblance to the forces that had fought to defend the Pusan perimeter. US airpower matured rapidly after Korea and during the Vietnam conflict. Large increases in speed, range, and payload were common in almost all aircraft types. Additionally, new capabilities were available by the spring of 1972. Helicopters, fixed wing airborne command and control centers, and KC-135 air refueling aircraft filled the skies. Laser guided bombs, remotely piloted vehicles, and electronic combat systems were new tools with which to attack the enemy. When used together, these systems provided an increased ability to quickly mass from widely dispersed locations and accurately focus combat power on the battlefield. The data below shows but one part of the transformation.

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Vietnam 1972 - US Airpower

	<u>Speed</u>	<u>Range</u>	<u>Msn or Payload</u>
<u>F-4 fighter</u>	1,585 mph	785 miles	11,000 lbs guns/ missiles/bombs
<u>B-52 bomber</u>	660 mph	3,000 miles	60,000 lbs bombs
<u>AC-130 gunship</u>	250 mph	1,500 miles	4 x 7.62 miniguns
<u>KC-135 tanker</u>	585 mph	1,150 miles	120,000 lbs fuel
<u>C-130 airlift</u>	385 mph	3,500 miles	35,000 lbs cargo
<u>UH-1F helo</u>	125 mph	320 miles	4,500 lbs cargo/guns or 9 troops
<u>EA-6B ECM</u>	500+mph	air refuel+	ECM jammer
<u>AQM-34 RPV</u>	Data not released;	did recon and	jamming

This table is noticeably larger than the World War II and Korean era listings because of the expanded scope of US airpower. Combat would test the value of each new capability.

On the positive side, US airpower responded quickly to the invasion. Marines deployed three F-4 fighter squadrons, some EA-6 electronic countermeasure (ECM) aircraft, and TA-4F forward air control platforms while the Navy shifted six aircraft carriers, each with an air wing of at least 90 aircraft, into the theater.<sup>65</sup> The Air Force likewise moved 236 combat aircraft, along with 161 B-52 bombers and 168 KC-135 air refueling tankers<sup>66</sup> from the US. This deployment of US airpower reinforcements into the theater manifested a relatively new capability, namely the ability to respond rapidly and focus combat power on a tactical problem over intercontinental distances. For example, some B-52's were flying bombing missions over Vietnam less than 72 hours after receiving deployment alert at their<sup>67</sup> stateside bases. Air Force General Lucius Clay, commander of Pacific Air Forces remarked,

I think probably the most significant change in airpower over the last 25 years...is this complete flexibility and our capacity to respond at a moment's notice. If anybody had told me 25 years ago that you could take a fighter wing out of Holloman Air Force Base, New Mexico and have it overseas in less than a week and have it flying combat, I'd have said "You're nuts!"<sup>68</sup>

US commanders made good use of this rapid deployment advantage and quickly focused airpower on two critical

tasks to slow the advancing North Vietnamese: close air support and intensive air resupply efforts.

Close air support by fighters, bombers, helicopters and gunships focused on countering the invaders' heavy weapons and large maneuver formations. The North Vietnamese protected their tanks and artillery with SAM systems.

Trying to detect and destroy artillery and armored vehicles while dodging SAM threats was a very difficult<sup>69</sup> task for the US airmen. The air-ground battle was fierce; US Air Force losses in the South amounted to<sup>70</sup> forty aircraft.

The cost was high but US airpower decimated the heavy strike capability of the North. The multiplicity of air assets proved its value. USAF fighters flying out of Thailand, supported by KC-135 aerial tankers and controlled by airborne command posts, hit targets,<sup>71</sup> refueled and cycled several times back to the battle.

Many aircraft carried 2,000 or 3,000 pound bombs equipped with laser guidance systems that were<sup>72</sup> especially effective stopping tanks. The final count showed that over seventy percent of the tanks destroyed or damaged were victims of tactical aircraft and<sup>73</sup> gunships. Close air support proved it was a key

tactical advantage for the US and the South Vietnamese.

B-52 strikes from Thailand and Guam also had a major impact on the battle. B-52s normally flew in groups of three with each aircraft carrying eighty-four 500 pound

and twenty-four 750 pound bombs. Dropping their bombs together, unseen and unheard from 30,000 feet above the enemy, using precise on-board radar systems, they would saturate an area one kilometer wide by three kilometers long. A.J.C. Lavalley, editor of an USAF study of the 1972 Easter offensive, noted it would take<sup>74</sup> almost sixty fighter bombers to cover the same area.

The B-52 strikes against enemy troops besieging An Loc demonstrated their tactical utility. Every fifty-five minutes for thirty hours straight, B-52s hammered the<sup>75</sup> forces surrounding the city. Brigadier General John McGiffert, US Army, described the B-52 forces as,

the most effective weapon we have been able to muster...The threat of heavy bomber strikes forces the enemy to break up his ground elements into small units and makes it difficult to mass forces for an attack. If he does mass his forces, he takes terrible casualties. <sup>76</sup>

There were 700 such B-52 sorties in March (most before the invasion against suspected logistics bases), 1,600<sup>77</sup> in April, and 2,200 in May.

The US airlift forces, helicopter and fixed-wing, were likewise busy. Helicopters played a key role by permitting troops and supplies to travel in relative safety directly to the battle-field; offsetting that tremendous mobility advantage was the fact they were<sup>78</sup> noisy, relatively fragile, and quite slow. On the fixed-winged side, USAF C-130s put their cargo carrying capacity to good use in very hazardous conditions. One AF general lauded the airlifters for their "magnificent

performance...in delivering arms, ammunition and food  
under intense fire from AAA and SAMS." <sup>79</sup>

The airlifters proved their tactical value in many ways. The enemy often threatened or cut off friendly ground lines of communication. Aerial resupply became the only way to sustain the ground forces until relief columns could fight their way through. <sup>80</sup> At Kontum from 7-14 June C-130 crews, using the newly developed All Weather Air Delivery System (AWADS), made 15 airdrops from 10,000 feet altitude and the largest recorded impact error was 300 meters. <sup>81</sup> This performance "...suggested that after three decades, the Air Force was close to solving one of its chronic weaknesses - accurate parachute resupply under conditions of night or bad visibility." <sup>82</sup> At An Loc, using the Ground Radar Aerial Delivery System (GRADS), C-130s dropped 492 bundles with a 94 percent recovery rate from drop altitudes above 6,000 feet. <sup>83</sup> Airlift, because of performances like these, proved its importance in reestablishing a favorable tactical situation.

Surprisingly, airpower successes were hampered in the first couple weeks of the battle because of a shortfall in a critical area - command and control. The authors of a USAF study about US airpower and the 1972 invasion pointed out the South Vietnamese were poorly prepared during the drawdown of US troops for handling large amounts of airpower. They also noted the US forces in

country had been cut back so much that they could not<sup>84</sup> handle large numbers of aircraft missions. Additional US controllers were rushed to the theater to fix the problem but the initial confusion, frustration, and inability to exploit available US airpower highlighted the need for experienced people to get the most out of the system.

A second limitation was the effect of bad weather on air operations. Although ground and aircraft radars went a long way towards lessening the impacts of foul weather, it still curtailed launch and recovery operations and shielded the invaders during the early<sup>85</sup> days of the crisis. Night operations were less of a concern because of aircraft like the AC-130 gunship; sophisticated sensors such as low-light and infrared<sup>86</sup> systems made night attacks much more effective.

The third major concern was the surface to air missiles, particularly the shoulder fired SA-7. They were a serious threat and accounted for many aircraft losses. Slow-moving aircraft and helicopters were very vulnerable and were effectively neutralized in many<sup>87</sup> cases because of the missiles. As aircrews gained experience working against the threat, and counter measures became more effective, the threat diminished;<sup>88</sup> but, the initial engagements were harrowing. In the end however, US airpower responded favorably to the challenges.



According to Harry Summers US airpower caused 100,000<sup>89</sup> enemy casualties and blunted the offensive.

Similarly, author Stanley Karnow felt "[t]hough the South Vietnamese often displayed uncommon courage, they would have collapsed without American air support and the advisers to stiffen their ranks."<sup>90</sup> Thus, through the advantageous application of focused US airpower in support of ground efforts a tactical victory was achieved. The next major military challenge requiring a massive airpower response happened in the Middle East.

### The Gulf War

Iraq invaded Kuwait in early August 1990. It soon became clear that the US opposed the Iraqi actions and that a military response was likely. The stability of the entire region, historically a volatile area combining oil wealth and religious fervor, was threatened. It became imperative that a speedy solution be found in order to resolve the problem and return a semblance of stability to the region. After quick consultations with regional allies, a naval battle group, Marine forces, the US Army's 82nd Division, and the Air Force's 1st Tactical Fighter Wing deployed into the theater to confront the Iraqi forces poised on the Kuwaiti border with Saudia Arabia.

After numerous diplomatic, political, and economic attempts to convince Iraq to withdraw from Kuwait

failed, the US led coalition forces finally resorted to military means to resolve the problem and launched an air attack against Iraqi forces in Kuwait and targets in Iraq itself. The unilateral air attacks lasted 38 days and showed, particularly in regards to US airpower, a remarkable diversity.

The spectrum of US airpower capabilities grew in many ways between Vietnam and the Gulf war. It now included specialized reconnaissance like the high-flying TR-1 and sophisticated radar assisted command and control in the form of the Airborne Warning and Control System (AWACS). Advanced attack helicopters such as the AH-64 Apache, and sea and air launched cruise missiles, gave commanders more choice about how they wanted to attack difficult targets. Extremely accurate on-board navigation aids provided unprecedented reliable guidance to airmen in all flying conditions. Dedicated close air support and special operations aircraft addressed shortcomings in those areas. Airmen exploited other mediums as well. More powerful and varied electronic combat platforms along with space based systems for communications, intelligence, navigation and weather support gave the US advantages over almost all other potential adversaries. And, finally, the stealth fighter represented a revolutionary approach to attacking high-value enemy assets. The following data summarizes some of the key performance factors.

The Gulf War and US Airpower

	<u>Speed</u>	<u>Range</u>	<u>Msn / Payload</u>
<u>F-111</u>	1,665 mph	3,800 miles	27,000 lbs ordnance
<u>F-15</u>	920 mph	2,500 miles	16,000 lbs ordnance
<u>A-10</u>	520 mph	300 miles	16,000 lbs ordnance
<u>C-5</u>	570 mph	6,500 miles	100,000 lbs cargo
<u>KC-10 tanker</u>	610 mph	3,800 miles	170,000 lbs fuel
<u>TR-1</u>	600 mph	3,800 miles	80,000' alt recon
<u>Pioneer RPV</u>	148 mph	6 hrs	450 lbs of various recon and intel packages
<u>Cruise missile</u>	500 mph	1,500 miles	Accuracy = 65 feet
<u>AH-64</u>	230 mph	375 miles	Guns and missiles
<u>AWACS</u>	625 mph	4,300 miles	Radar detection of tgts beyond 230 miles

Most of these systems could focus airpower on targets across the various levels of war. As noted in this paper, overlap between the various levels of war (strategic, operational, and tactical) can happen as forces deal with a wide variety of situations and conditions; this was certainly the case in the Gulf war.

US airpower strikes in the war exploited inherent advantages to attack key enemy facilities. The first air strike was a joint USA/USAF helicopter assault against front line Iraqi early warning radar and command and control positions. US Army AH-64 Apache attack helicopters, using night flying aids and armed with cannon and long-range laser guided missiles, penetrated

the forward Iraqi defenses by following USAF MH-53J special operations helicopters using high precision<sup>92</sup> navigation systems. Their attack, combined with F-117 stealth fighter strikes against other radar sites, opened a hole in the forward defenses and allowed the initial strike force on 17 Jan 1991 to "retain total tactical surprise until the bombs started falling on<sup>93</sup> Baghdad."

Using the cover of tactical surprise, US airpower struck targets all over Iraq and Kuwait. The first night one strategic target hit -- the national air defense operations center in downtown Baghdad -- had immediate ramifications on the tactical fight for air<sup>94</sup> superiority. The center was a key link in the formidable but highly centralized Iraqi air defense system made up of more than 16,000 radar-guided and heat<sup>95</sup> seeking SAMs and 7,000 anti-aircraft guns. After the destruction of the operations center, the remainder of the air defense system was systematically dismantled by<sup>96</sup> an integrated AWACS, fighter, and SAM hunter system. US airpower quickly won air superiority and then complete air supremacy. US air combat power subsequently shifted its primary focus to attacking the Iraqi field forces.

The Iraqi ground order of battle included 900,000 troops equipped with 5,700 tanks, 5,000 armored vehicles<sup>97</sup> and 3,700 artillery pieces. US battlefield air attack

efforts started with intensive intelligence gathering. Airborne cameras along with remotely piloted vehicles and tactical reconnaissance aircraft (TR-1s) provided information to help focus tactical air combat power on cutting off Iraqi forces.<sup>98</sup>

The interdiction of enemy support going to Kuwait benefitted from accurate navigation aids such as the GPS (Global Positioning System) and LANTIRN (Low-altitude Navigation and Targeting Infrared for Night) systems. These capabilities, coupled with precision guided munitions (PGMs), made many air missions one pass, one bomb, one target destroyed.<sup>99</sup> Many direct attacks against the Iraqi heavy forces had the same success rate.

US airpower was able to use its technological advantages for tactical purposes as it went after armored vehicles and artillery pieces. F-111s using laser guided bombs destroyed more than 1,000 vehicles; A-10s, using mostly precision guided missile attacks, put more than 4,200 vehicles and artillery pieces out of action.<sup>100</sup> While the tactical air battle proceeded, theater tactical airlift helped reposition men and supplies for the upcoming ground operation.

C-130s flew almost 47,000 sorties, delivering more than 300,000 tons of cargo and 209,000 troops.<sup>101</sup> According to theater logistics experts this airlift "became a tremendous combat multiplier...".<sup>102</sup> In the

same way, B-52s focused more and more on being combat multipliers by bombing front line areas. As an example, B-52s made thirty to forty bombing sorties every night for several nights in front of US Marine positions before the ground war started.<sup>103</sup>

On the negative side, the US lost 63 aircraft (including 5 helicopters) during the Gulf war<sup>104</sup> and incidents of air-to-ground fratricide dampened otherwise high spirits.<sup>105</sup> Bad weather covering the region adversely affected the use of airpower by restricting the flow of photo intelligence; the impact was mitigated somewhat by the complementary nature of the collection assets.<sup>106</sup> Adverse weather also reduced sortie rates on some days by one-third from peak levels<sup>107</sup> and reduced some precision munition performance by accentuating bomb and missile seeker-head limitations.<sup>108</sup> In the final analysis however, airpower advantages outweighed the problems and coalition ground forces executed their portion of the campaign, ejecting the Iraqis from Kuwait in short order and with few casualties.

#### TREND ANALYSIS

Do any discernible trends emerge after looking at these four battles spread out over a 50 year period? Some strengths and weaknesses do seem to stand out. Starting with strengths, four seemed significant: firepower, flexibility, responsiveness, and psycho-

logical effects on ground troops. Specifically, US airpower has shown an increasing ability to focus firepower on air and ground tactical battles in ever more lethal and precise ways. The B-52 raids and F-4 laser guided bomb attacks in Vietnam and the F-111 precision strikes on Iraqi vehicles all attest to this improvement.

Additionally, US airpower has been applied in new and more flexible ways. The US started with a conventional mix of bombers, fighters and airlifters. It has now built a complex and often integrated airpower system ranging from attack helicopters to remotely piloted vehicles and space based intelligence and navigation systems.

In the third area, technology has also had a beneficial impact on US airpower responsiveness. Because of steady advances in technology, US airpower can fly faster, over longer distances, while carrying more and doing more missions. Fighter speeds and ranges have increased from 420 mph and 450 miles in the case of the P-38 in World War II to 1,655 mph and 3,000 miles for the F-111. The P-38 could carry 2,000 lbs of bombs; the F-111, 27,000 lbs. The examples of technological improvements could continue in many other areas such as navigation, communication, maintenance, detection, and targeting. The overall effect has been an increased ability to concentrate airpower where needed to more effectively confront the enemy under varying conditions.

The final positive trend concerns the consistent pattern of prisoner comments about the effectiveness of US airpower. A recurrent theme was the psychological effect of US airpower attacks on enemy ground troops. This impact was again noted in the Gulf war where prisoners stated they truly feared the B-52s; when surrendering, many of them had punctured eardrums and infected sinuses as a result of the concussions from the large bomb loads dropped by the B-52s.<sup>109</sup> The comments by the prisoners matched an observation made by Anthony Kellet in his book Combat Motivation. He noted that a British psychiatrist asserted the most severe stress soldiers faced was continued air attack particularly when they could not fight back and saw their own air force was not fighting to protect them.<sup>110</sup> The psychological benefit of airpower is hard to calculate but it definitely exists.

On the negative side there are some nagging shortfalls in the tactical application of US airpower. The recurring weaknesses are night and adverse weather operations, detection and interdiction of enemy forces, the need, most of the time, for large stable areas such as aircraft carriers or airfields to conduct operations, and, finally, fratricide.

US airpower has progressed over time in its attempts to overcome the limitations imposed by reduced visibility operations. Night operations are now almost



as accurate as day missions because of new radars, navigation systems, and precision munitions guided by laser energy or television images. The main hindrance at night is the fact that not all airpower assets are fitted with the requisite avionics equipment which is expensive. Adverse weather remains a difficult challenge. Hazards such as heavy rain, lightning, and strong turbulent winds form natural obstacles that airmen have and will continue to grapple with. Yet even these problems no longer provide complete cover for enemy movement given the advanced airborne and ground control radars as proven by the B-52 drops or the AWADS resupply drops in Vietnam.

Another tough problem was the interdiction of enemy forces. Detection proved the biggest hurdle: new radars and sensors do a better job helping airmen identify targets such as bridges or vehicles. Masses of infantry, in contrast, moving on foot and hand-carrying supplies in rugged terrain such as in Korea and Vietnam, were still difficult to spot. Additionally, in none of the battles were all of the supplies stopped. While it was probably unnecessary to completely cut off the logistics flow, it nevertheless showed that US airpower could not put up an impenetrable interdiction wall.

Large airfields or aircraft carriers play a key role insuring the availability of US airpower yet they can be both quite vulnerable and a limiting factor. Facilities

far from enemy threat are not normally at risk; rather, it is those air bases placed close to the battle for the quickest possible air response that are such inviting targets. In Korea especially this became a concern during the early stage as the allied airfields were overrun. As far as being a limitation, in the Gulf war the US deployed 302 aerial tankers, fully half of the total AF fleet, to support operations. Airfields (and aircraft carriers) were scattered over vast distances and, even with improved range capability, most aircraft needed to refuel in-flight to get to their targets and back to their bases.<sup>111</sup> The successful air effort was possible, in large measure, because of the tankers but that accomplishment should not mask the fact that air bases remain big, vulnerable, immobile targets.

Lastly, fratricide remains a recurring airpower failing; friendly losses happen in every battle. Normally the losses occurred in the early phases when poor communications and lack of commonly understood procedures clouded the situation during desperate battles. Air-to-ground fratricide during the Gulf war, while small in number and not as widespread as ground-to-ground fratricide, nevertheless still occurred.<sup>112</sup> Both US Army helicopters and USAF aircraft fired on friendly troops. General McPeak, AF Chief of Staff, noted the USAF attacked almost 10,000 vehicles and made two tragic mistakes in the "fog of combat" at

night in heavy ground fighting. He expressed his regret and reiterated it was a problem US airmen work on all the time.<sup>113</sup> Given the fast pace of modern war this last problem trend will, unfortunately, continue to happen.

### EVALUATION

We have the enemy surrounded. We are dug in and have overwhelming numbers. But enemy airpower is mauling us badly. We will have to withdraw.

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Japanese infantry commander

US airpower has clearly evolved into a very powerful instrument of war but it is important not to get carried away and take too much from the analysis of these battles. Gary Cox asserted in a recent article that Michael Howard was correct to counsel that military history be read in breadth, depth, and context.<sup>115</sup> Yet this is difficult to do, especially in the case of the Gulf war when events are still relatively fresh and much study is still under way.<sup>116</sup> Is it possible to learn anything usable? The answer is yes as long as one recognizes that all the battles looked at had their own unique context. Other battles show the limits of airpower's tactical effectiveness. The battle for Okinawa, where the Japanese went underground to fight, was an instance where airpower was mostly negated and grueling ground combat was the only way to get at the

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enemy. In Vietnam a major difficulty for the American military was, as one author wrote, "finding the enemy so overwhelming firepower could be brought to bear."<sup>118</sup> An elusive enemy can thus blunt airpower's effectiveness. Yet, despite these limits, it is clear that technology has driven US airpower to higher levels of effective performance.

This study also shows that infatuation with technology needs tempering. Colonel Dennis Drew, an airpower doctrine analyst, remarked that in war Americans prefer to spend bombs and bullets instead of American youth. He says that during Vietnam aircraft dropped 8,000,000 tons of bombs, four times the total dropped in World War

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II. Yet it is apparent that trusting in technology alone to win wars is misguided. As aerospace historian Professor Richard Hallion wrote, "[t]echnology devoid of strategic thought and doctrinal underpinnings is incapable of serving a nation's defense needs."<sup>120</sup>

Colonel Drew noted that superior technology has rarely been a decisive factor in any American war; the more important and biggest struggle has been to use technology effectively and to adjust to enemy technology.<sup>121</sup> Why?

He gave four reasons: technological advantages are short lived, possession does not mean advantages will be exploited effectively, superiority can be negated by different weapons, better defenses and superior strategy

and tactics, and, lastly, the full effects of technology  
122  
may be limited by political considerations.

Colonel Drew's concerns about counter measures to technology deserve a closer look. Is US airpower vulnerable to some new development? The conventional mechanized battlefield will be a very hazardous place and Professor Hallion described it like this:

The air-land battlefield of the future will be intense, fluid, fast-moving, and deadly...both sides will attempt to maintain and "choreograph" a tempo of warfare forcing the enemy to constantly defend against a multitude of threats: "fast-movers" such as jet fighter-bombers, "pop-up" attacks from gunships, "fearless" RPV attacks against battlefield electronic emitters, stealth aircraft, conventional and rocket artillery, and combined infantry-armor assault. 123

Future battles will indeed be deadly arenas. Is US airpower thus an unreliable partner suspect to being neutralized by some new technological advance? That is doubtful. One constant finding woven throughout this study is that US airpower is actually a remarkable constellation of evolving capabilities, all at once integrated, interdependent, and complementary. While not perfect, history has shown it has emerged to be a devastatingly effective tactical weapon in battle.

The growth in US airpower capabilities has also led to a situation where it can be hard to separate tactical effects from operational or strategic effects. This blurring is actually natural and has been present for some time because airpower can strike the enemy in so many places and in so many ways. General Spaatz said:

"There was no line of cleavage between strategic and tactical air forces. It was over-all effort, uniting all types of aircraft, coordinated for maximum impact."<sup>124</sup> General Spaatz also said that people tended to over-emphasize certain aspects of airpower and in so doing ignored the versatile application of the tool.<sup>125</sup> The US Air Force recently relearned these lessons and looked at its organization for ways to improve its ability to conduct air operations. It decided it needed to delete structures that fragmented airpower. Strategic Air Command, Tactical Air Command, and Military Airlift Command were deactivated and Air Combat Command and Air Mobility Command took their place.<sup>126</sup> These changes reflect a growing understanding, at least within the USAF, that US airpower is neither tactical or strategic; instead, it is combat power best focused on the most critical spots, as part of an integrated team effort, to help win battles and wars.

Understanding these many lessons is critical in order for the US military to keep its mental edge. An alternative, as authors Cohen and Gooch point out in their book Military Misfortunes, is failure either through an inability to learn, or to anticipate, or adapt.<sup>127</sup> The way to avoid this trap, they say, is for military organizations to "inculcate in their members a relentless empiricism....the 'learners' in military organizations must cultivate the temperament of the

historian, the detective, or the journalist...".<sup>128</sup>  
Professor Holley, a respected military historian, reaffirmed this belief when he concluded military men must avoid turning doctrine into dogma by learning to "appreciate the implications of technical advances which holds great potential for reshaping the character of warfare."<sup>129</sup>

The biggest implication of this study is that US airpower has, to paraphrase Colonel Drew, matured as an instrument of warfare in much more than technical sophistication. The potent force that exists today is the result of 80 years of maturation of experience,<sup>130</sup> technology, and doctrine. The big question is whether or not US military leaders truly appreciate how airpower has changed.

### CONCLUSION

Too often two equally fallacious viewpoints concerning battlefield air support have reigned: that air support has not been of significance to the land battle and that air support has been decisive in land warfare. The actual answer, of course, is in the middle.

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Richard Hallion

This paper sought to discover whether or not US airpower has emerged as one of America's main tactical advantages capable of carrying the main fight to the enemy. The best tool to evaluate the question was history but the lessons of history are wrapped up in the

special context of the times; separating the timeless lessons from time period lessons was difficult but the military must try to learn in order to avoid failure, in order to win wars. Thus battles were analyzed from World War II, Korea, Vietnam and the recent Gulf war to see if any trends existed that showed US airpower emerging as an dominant tactical force. Airpower performance showed big improvements from the battle for Buna to Desert Storm and it is clear from this perspective, as well as the quantifiable technical view, that US airpower has become a very strong and diverse combat force. Recognition of this fact by US military planners and leaders should pay dividends when future challenges come. Napoleon once said the following:

If I always appear prepared, it is because before entering on an undertaking, I have meditated for long and have foreseen what may occur. It is not genius which reveals to me suddenly and secretly what I should do in circumstances unexpected by others; it is thought and preparation. 132

Success for present and future US civilian and military leaders lies in pondering and understanding the character of the all the military tools, sea, ground, and air, at their disposal; attitudes and perceptions fixated on one time period and old capabilities can be very costly. Mental flexibility and openness are a must because anything less courts disaster.



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